A BRIEF OUTLOOK OF TEXAS SPECIAL EDUCATION TEACHERS' KNOWLEDGE AND SKILLS IN AUGMENTATIVE AND ALTERNATIVE COMMUNICATION

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Abstract

Texas special education teachers need be well-equipped to meet the needs of all students with disabilities, including those with complex communication needs. To do so, special education teachers need to gain knowledge and skills in augmentative and alternative communication. Unfortunately, research has consistently suggested that special educators are unprepared to effectively serve students with complex communication needs. The aim of this article was to supplement the current research by providing a brief outlook on the state of knowledge and skills of special education teachers in Texas in augmentative and alternative communication. Findings suggest that special education teachers in Texas reported low levels of knowledge and skills in augmentative and alternative communication, with years of experience serving students with complex communication needs as the only influencing factor. Implications and recommendations for future pre- and in-service training are discussed.

Keywords: augmentative and alternative communication, special education teachers, teacher certification

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Special education teachers require specialized training to address the educational needs of students with disabilities. According to the U.S. Bureau of Labor Statistics (2020), in Texas there are approximately 38,400 special education teachers. Texas offers two potential routes to obtain teacher certification in special education, by completing (1) a teacher preparation program or (2) an alternative process such as *Teach for America* or *Teachers of Tomorrow*. Across the state there are 47 universities that have teacher preparation programs that lead to a special education teacher certification. Among these universities, 28 offer both bachelor's and master's degrees, 18 universities offer either a bachelor's (n = 12) or a master's degree (n = 6), and 1 university only offers a certification program. Most of these teacher preparation programs lead to a certification in *Special Education, Early Childhood-Grade 12*, with a few universities offering certification in *Deaf and Hard of Hearing, Early Childhood-Grade* 12.

The *Special Education Early Childhood-Grade 12* teacher certification enables special education teachers in Texas to serve students across *all* disability categories, including students being served under the IDEA categories of

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mild to severe disabilities (see IDEA, 2004 §662). Across the United States 18 (35.29%) states, including Texas, offer a cross-categorical special education teacher certification, 23 (45.10%) offer a categorical certification, and 10 (19.61%) offer cross-categorical certifications with the possibility of an added categorical endorsement. The main differences among these certification options are in the way teacher preparation programs are tasked to equip special education teachers to serve students with disabilities. These requirements are closely linked to standards set by the State for teacher preparation programs. Specifically, in a *cross-categorical* certification teachers are prepared to serve students across all disability categories and often across all grade levels; while in a *categorical* certification, teachers are prepared to serve a specific sub-group of disability categories, for example to serve students with high-incidence disabilities (e.g., learning disabilities, emotional and behavioral disturbances) or students with low-incidence disabilities (e.g., autism, intellectual disabilities), and often across all grade levels. In Texas, for special education teachers to gain specialized training in a specific disability category, they can choose to complete a master's degree with a focus on their area of interest. Because Texas offers a cross-categorical special education teacher certification, teacher preparation programs are responsible for ensuring that future special education teachers enter the field well-equipped to effectively serve *all* students.

Among students with disabilities being served by special education teachers in Texas, there is a subset of students with more significant needs, also known as severe disabilities (Westling et al., 2020). Many of these students receive services under the eligibility categories of autism, developmental delays, intellectual disabilities, multiple disabilities, or traumatic brain injury (IDEA, 2004, §1462). Students with severe disabilities often present comorbidity of complex communication needs (Page & Quattlebaum, 2012), and can benefit from the use of augmentative and alternative communication (AAC) systems. The goal of AAC is to support users' by increasing their independence and at the same time, reduce their communication challenges, by replacing or supplementing their oral speech abilities by using a speech-generating device, tablet with communication apps, manual signs, picture symbols, among other modalities (Da Fonte & Boesch, 2019).

Given the importance of AAC systems and practices, it is important to determine the extent to which Texas teachers have knowledge and skills in this area. Research spanning over 25 years has consistently shown that special education teachers have limited preparation in AAC (Andzik et al., 2018; Andzik et al., 2019; Costigan & Light, 2010; Koul & Lloyd, 1994). However, less is known about how specific states compare to findings from nationwide studies. Based on the differences between special education teacher certification across states, there is a need to critically evaluate the current knowledge and skills of special education teachers at the state level. While Andzik et al. (2018) examined the preparation in AAC received by special education teachers across various states, the authors did not report findings based on individual states. Therefore, the aim of this article was to report the findings on the self-reported knowledge and skills in AAC of special education teachers in Texas. Specifically, by addressing the research questions of: (1) What are Texas special education teachers reporting as their primary sources of knowledge and skills in AAC? (2) What factors influenced the knowledge and skills in AAC of special education teachers in Texas? (3) What was the most beneficial pre-service training of Texas special education teachers to support students with complex communication needs? (4) What do special education teachers report on AAC professional development training opportunities in Texas? (5) What are Texas special education teachers' recommendations for pre-service and novice teachers on AAC training?

Methods

Participants

The participant pool was extracted from a nationwide survey led by Da Fonte et al. (in press). The inclusion criteria for this paper were for participants to (a) be working as special education teachers in Texas; (b) have a special education teacher certification, and (c) have experience serving students with complex communication needs. General education teachers, related service providers such as speech-language pathologists and occupational therapists, and school administrators, such as special education directors or instructional coaches were excluded.

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Survey Instrument

A cross-sectional (Creswell & Creswell, 2021) online survey was developed to collect data pertaining to the AAC knowledge and skills of special education teachers. The Research Electronic Data Capture (REDCap™) platform was used to create and disseminate the survey. A total of seven individuals, who were not involved with the study, evaluated the survey for its usability. Evaluators included four special education teachers and three university professors who provided feedback on the survey's format, clarity of the questions, and type of responses. The survey was revised based on the feedback prior to its dissemination. A total of 32 questions were analyzed for this study including, 16 demographic questions, 13 questions on knowledge and skills in AAC, and 3 open-ended questions on participants' reflections and recommendations on AAC training. Cronbach's alpha (.97) and Pearson's correlations were calculated to analyze the internal consistency of the survey, resulting in high internal reliability ($p < .01$), as the coefficient of variation was low for each question. Construct validity was also assessed to mitigate any potential threats that exist with self-report (Conway & Lance, 2010). Specifically, a principal component factor analysis was used to determine if knowledge and skills factors could be categorized by one common factor, thereby identifying relations within the dependent variables (Brown, 2015). Factor loadings ranged from .865 to .93; thus, 80.9% of the variance could be explained by one common factor.

Procedures

To recruit participants, an email list of 1,167 school administrators (e.g., special education directors, principals, and superintendents) was created by the research team by searching the Texas Education Agency website for administrators' contact information. The survey link was sent to the school administrators alongside a brief description of the study, a statement indicating the university's Institutional Review Board approval, and a request for the administrators to disseminate the survey link to all special education teachers in their schools. Reminders were sent every three weeks for six months.

Data Analyses

Data for all fully completed surveys were analyzed using SPSS Statistics software. Descriptive statistics correlate the extent of knowledge and skills in AAC, and thematic analysis was used to examine the data. All questions with a Likert scale of 1 to 5 were added to ascertain a total score on the participants' knowledge and skills, ranging from 8 to 40 possible overall scores, given that there were 8 questions. To further quantify the mean scores of knowledge and skill, scores ≤ 24.99 were classified as "low" levels of knowledge and skills, and scores ≥ 25.00 were classified as having "high" levels.

To determine the relationship between participants' self-reported knowledge and skills in AAC and their demographics, one-way ANOVAs (F tests) were used. Furthermore, to assess the differences for each item, repeated measures ANOVAs were conducted and Chi-square tests (X^2; $p < .05$) were used to determine if statistical differences existed between the participants' demographic variables and their knowledge and skills in AAC (low and high). Eta-squared (η^2) was also calculated to evaluate the relationship between the two variables, and to determine effect sizes of significant correlates (Cohen, 1988; Durlak, 2009). A small effect size was 0.01, the medium was 0.06, and a large effect size was 0.14 (Cohen, 1988).

Thematic analyses were conducted for each open-ended question. Each question was independently coded by two coders to determine coding reliability. Based on participants' responses, each response could be coded once under a particular theme or across various themes. To assess reliability between coders Cohen's Kappa was calculated with results indicating almost perfect agreement (0.968).

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Results and Discussion

A total of 25 special education teachers from Texas served as participants in this study (see Figure 1 and Figure 2). Approximately 52% (*n* = 13) of the participants' highest degree was a bachelor's, and the remaining 48% had a master's degree (*n* = 12). On average, participants had 10 years of teaching experience (ranging from 1 to 20+) and approximately 7 years of experience serving students with complex communication needs (ranging from 1 to 20+). Approximately 52% of the participants worked in urban settings (*n* = 13), 28% in suburban settings (*n* = 7), and 20% in rural settings (*n* = 5). Most of the participants (76%; *n* = 19) taught in public schools and in public charter schools (16%; *n* = 4), and the remaining taught in private (4%; *n* = 1) and residential schools (4%; *n* = 1). Close to half of the participants taught in elementary schools (48%; *n* = 12), 40% (*n* = 10) taught in middle schools, and 12% (*n* = 3) taught in high school settings.

Figure 1

Participant Experience Demographics

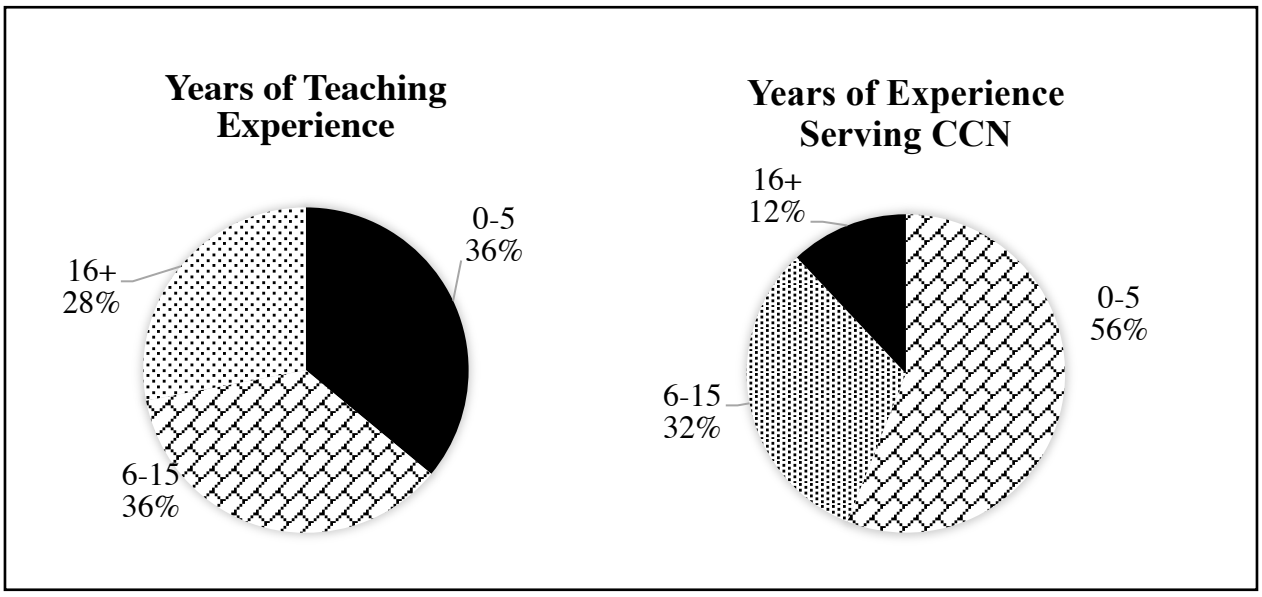

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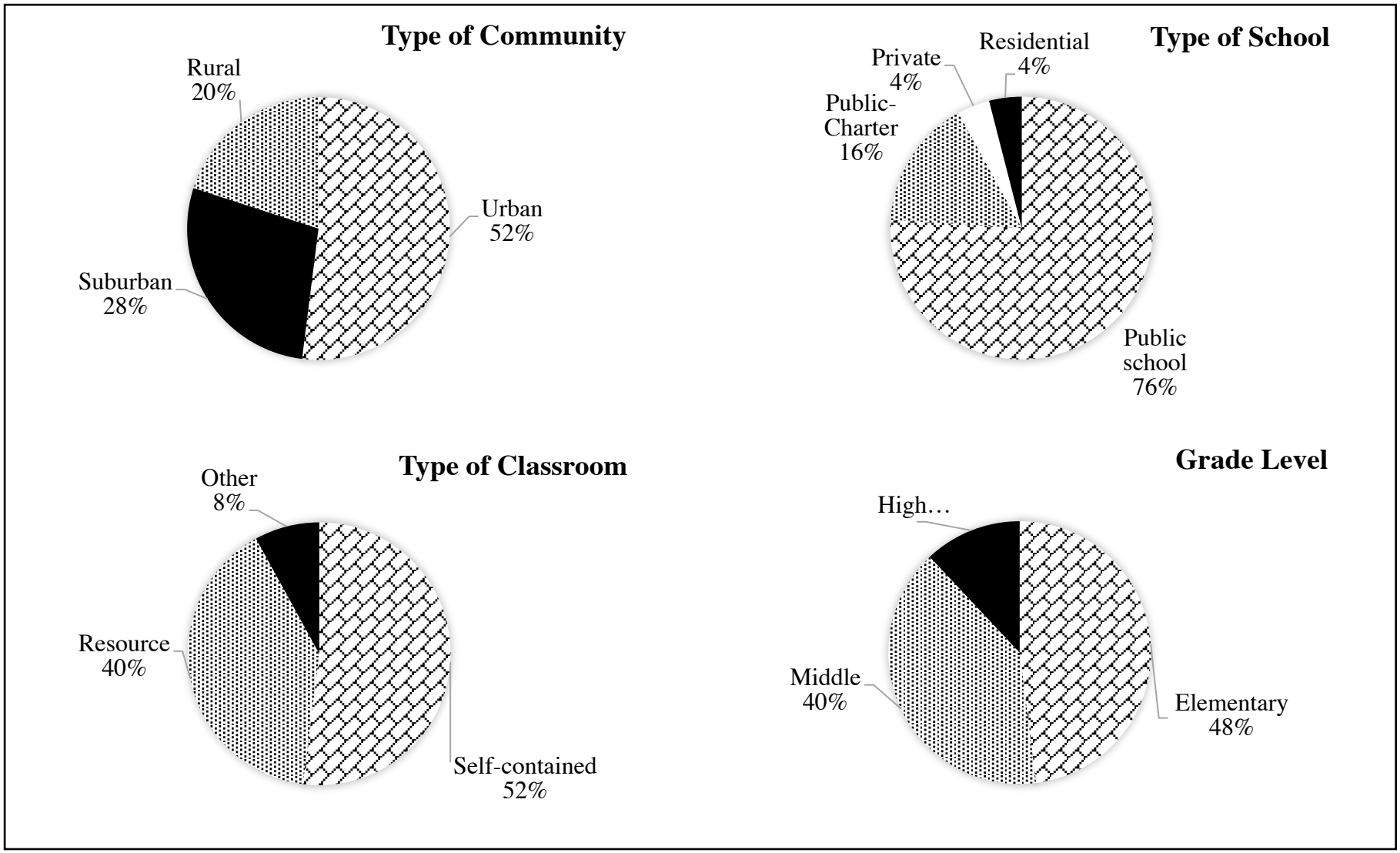
Figure 2

Participants' Work Setting Demographics



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Teacher's Knowledge and Skills in AAC

Findings indicated that the majority of participants self-reported low levels of knowledge and skills in AAC (68%; n = 17). Results indicated that years of experience serving individuals with complex communication needs was an influencing factor on participants' perceived levels of knowledge and skills ($F = 4.767$, $p = .019$, $\eta^2 = 0.302$). Across all questions related to participants' self-reported knowledge and skills, the mean score was low (20.08) ranging from a possible score of 8 to 40. The criteria set for low levels of knowledge and skills was <24.99 and >25 for high. Participants' self-reported levels of knowledge and skills are comparable to national results indicating that special education teachers are not well-equipped to implement AAC practices (see Andzik et al., 2019; Da Fonte et al., in press).

Results indicated that participants' primary source of knowledge and skills in AAC was their personal experiences (40%; n = 10), followed by coursework (20%; n = 5), and professional development (16%; n = 4). Further, over half of the participants (56%; n = 14) reported having no pre-service field experiences, such as practicum, where AAC practices were implemented. Although 44% (n = 11) of the participants reported completing 1 to 2 field experiences during their preparation programs. However, for those who completed a field experience, 8% (n = 2) indicated completing 1 field experience where AAC practices were embedded as part of the practicum, and 4% (n = 1) indicated completing 2+ embedded field experiences. While 28% (n = 7) completed 1 field experience where the sole purpose was to implement AAC practices, and 4% (n = 1) completed 2 or more of these dedicated field experiences.

Based on the findings, it is likely that special education teachers are not receiving coursework or field experiences during their pre-service preparation programs to develop knowledge and skills in AAC. Similarly, based on self-report, data suggests that special education teachers are not receiving professional development in AAC to expand their professional knowledge and skills. As a result, special education teachers seem to be relying on on-the-job training and personal experiences. Findings align with previous research indicating there is a lack of AAC training for special education teachers at the pre-service level (e.g., Costigan & Light, 2010; Koul & Lloyd, 1994). To better support special education teachers and their students with complex communication needs, it is critical to create professional development training opportunities for special education teachers throughout their careers. The notion that professional development is a critical factor for special education teachers to provide AAC services has been well documented (Andzik et al., 2019; Sindelar et al., 2010). In fact, Sindelar et al. (2010) argued that professional development training should be implemented for all special education teachers, no matter their level or years of experience. By doing so, teachers will sustain their professional development and dispositions that were initiated during their pre-service preparation program, and these can be enhanced through induction opportunities (Sindelar et al., 2010).

Influencing Factors on Knowledge and Skills

Findings indicated that most factors were not influencing the participants' knowledge and skills in AAC. As illustrated in Tables 1 and 2, the highest level of education, the year when their highest degree was earned, the completion of field experiences during pre-service training, the type of community, school, classroom, or grade level where participants worked, and participants' years of teaching experience did not influence the special education teachers' abilities. However, as represented in Table 3, participants with 6 to 15 years of experience serving students with complex communication needs was a significant influencing factor to their knowledge and skills, given that they reported the highest level of knowledge and skills in AAC (M = 27.38, SD = 8.03). Intriguingly, participants who self-reported having 16+ years of overall teaching experience indicated having the lowest level of knowledge and skills in AAC (M = 13.67, SD = 4.93). Although years of experience serving students with complex communication was an influencing factor, it is important to acknowledge that the level of knowledge and skills in AAC remained low, with the most knowledge and skills in introductory-level concepts (M = 2.76, SD = 1.234) and the least in concepts related to AAC assessment (M = 2.16, SD = 1.179).

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Table 1

Work Setting Demographics Compared to Participants' Knowledge and Skills in AAC

Work setting	*n*	Mean scores			
		M	SD	*F*	*p*
Community Type				1.125	0.342
Urban	13	21.38	0.76		
Suburban	7	21.71	11.27		
Rural	5	14.40	4.22		
School Type				2.970	0.055
Public	19	21.00	8.45		
Public Charter	4	13.50	9.04		
Private	1	39.00	-		
Residential	1	10.00	-		
Grade Level				1.457	0.255
Elementary	12	17.08	6.11		
Middle	10	21.80	10.45		
High	3	26.33	16.26		
Classroom Type				1.739	0.199
Self-Contained	13	22.62	8.21		
Resource	10	15.90	8.10		
Other	2	24.50	22.92		

Note. AAC = augmentative and alternative communication.

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Table 2

Comparison of Participants' Experiences and Their Knowledge and Skills in AAC

Type of experience	*n*	Mean scores			
		M	SD	*F*	*p*
Personal Experience				1.972	0.149
Not at all	0	-	-		
Slightly	4	15.00	1.41		
Somewhat	4	12.75	7.54		
Very much	7	24.14	9.41		
Extensively	10	22.20	10.50		
Coursework				0.256	0.902
Not at all	3	17.33	10.21		
Slightly	9	19.00	9.68		
Somewhat	7	20.57	9.41		
Very much	1	17.00	-		
Extensively	5	23.60	12.05		
Field Experience				2.105	0.118
Not at all	14	17.14	8.65		
Slightly	7	21.86	7.29		
Somewhat	1	32.00	-		
Very much	2	19.00	15.56		
Extensively	1	39.00	-		
Professional Development				1.902	0.150
Not at all	3	21.00	16.09		
Slightly	5	14.00	2.55		
Somewhat	9	18.00	7.18		
Very much	4	22.25	10.78		
Extensively	4	29.50	9.54		
Other				0.761	0.563
Not at all	7	19.86	11.44		
Slightly	4	12.75	2.06		
Somewhat	5	22.40	4.72		
Very much	5	21.60	12.01		
Extensively	4	23.00	11.91		

Note. AAC = augmentative and alternative communication.

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Table 3

Comparison Between Participants' Background and Knowledge and Skills in AAC

Background	*n*	Mean scores			
		M	SD	*F*	*p*
Highest Degree Earned				0.060	0.808
Bachelor's	13	20.54	9.04		
Master's	12	19.58	10.41		
Years of Teaching				1.274	0.300
0-5	9	19.78	9.69		
6-15	9	23.56	10.01		
16+	7	16.00	8.14		
Years Serving CCN				4.767	0.019†
0-5	14	17.29	8.85		
6-15	8	27.38	8.03		
16+	3	13.67	4.93		

Note. † = significance at the level of .005; AAC = augmentative and alternative communication

Interestingly, Texas findings do not align with the data from special education teachers across the U.S. For example, Da Fonte et al. (in press) found several influencing factors, such as the highest level of education, the completion of field experiences during pre-service training, and type of teacher preparation certification program, on special education teachers' knowledge and skills. It is possible that the knowledge and skills of Texas' special education teachers were somewhat similar to each other given that Texas requires a cross-categorical teaching certification. This may imply that, unfortunately, many teacher preparation programs across the state may not offer specific coursework or field experience in AAC due to the broad focus of the certification. The lack of or limited pre-service training in AAC is problematic as it will shift the responsibility of specialized training to school districts. Nevertheless, given that public school districts commonly have limited financial and personnel resources, the lack of specialized training will likely perpetuate the teachers' limited knowledge and skills in AAC; which in turn, may contribute to underserving students with complex communication needs and limiting the outcomes of these students.

Teachers' Reflections on AAC Training

A total of 14 participants (56%) responded to the open-ended questions and provided their views and recommendations on potential changes for future pre-service and professional development training. There were 13 themes that emerged from participants' responses, with 3 pertaining to their reflections on pre-service training, 4 themes relating to their reflections on professional development, and 6 discussing their recommendations for pre-service and novice special education teachers. A common theme highlighted by participants was that they did, in fact, receive adequate pre-service training in AAC (42.86%; $n = 6$). One participant captured this notion by stating, "*I felt very adequately prepared to work with students with complex communication needs. I had an entire class devoted to AAC, as well as multiple practicum experiences where I got to see what I learned in class played out in the classroom*" (Participant 216); however, interestingly, low levels of knowledge and skills were reported by most participants. While participants indicated some positive outcomes during their pre-service training, other participants (21.43%; $n = 3$) expressed not receiving any training related to AAC during their teacher preparation programs. For example, Participant 251 stated that "*I've not been introduced to any [training],*" while others expressed that when training was provided, it was only some introductory content (14.29%; $n = 2$). Participants' responses align with findings that indicate special education teachers are likely to graduate from their pre-service teacher preparation programs with "unacceptably low levels of AAC knowledge and competence" (Costigan & Light, 2010, p. 208) and feel unprepared and ill-equipped to incorporate AAC in their classrooms (Ruppar et al., 2016).

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In terms of AAC training at the in-service level (professional development), some participants highlighted differences between their pre-service and in-service training. The notion that professional development training can help promote and foster knowledge and skills beyond their pre-service preparation program has been documented as essential to support students with disabilities (Sansoti et al., 2011). Participant 395 highlights this by indicating, "*I have received training while in college, but the most beneficial training has been through the district.*" However, most participants did not express these assertions; instead, many participants stressed a lack of AAC training across the pre-service and in-service levels (64.29%; $n = 9$). An example was outlined by Participant 216 who indicated that "*unfortunately, once you are out of pre-service, there are often limited opportunities to be trained in AAC or even collaborate with related service providers to learn how to effectively use them.*" Similarly, other participants (21.43%; $n = 3$) highlighted a lack of quality training, as one participant portrayed training in AAC as being "*in dire straits*" (Participant 460) and another that it was "*not good because I have not received any of it and didn't know it was a thing*" (Participant 81). Participants' responses continue to highlight that "*more training is needed if teachers are going to be able to adequately support students with complex communication needs*" (Participant 216).

Recommendations for Pre-Service and Novice Teachers

Participants highlighted how perspectives and mindset can impact service provision and that it may be helpful for novice teachers to consider their "… *aptitude and attitude towards AAC can go further than pre-service training*" (Participant 377). At the same time, participants indicated the need to be proactive (64.29%; $n = 9$), by "*read[ing] all you can on it [AAC] and seek PD pertaining to it [AAC]*" (Participant 460), "*get[ting] as much information on AAC and AT*" (Participant 349), and "*gain[ing] as much knowledge as you can*" (Participant 204). These statements exemplify the importance for special education teachers to be open to new information and willing to learn and implement new practices. Findings align with previous research, in which Lund and Light (2007) found that negative attitudes towards AAC to be barriers to positive outcomes and suggested that "professionals need to be patient, open-minded, and willing to try new things" (p. 333).

Practical Implications

Research has long established that special education teacher preparation programs are not adequately preparing special education teachers to serve students with complex communication needs (Andzik et al., 2019; Costigan & Light, 2010; Koul & Lloyd, 1994). Koul and Lloyd (1994) argued that special education teacher preparation programs should focus on embedding and enhancing AAC coursework to adequate levels. Similarly, Costigan and Light (2010) more recently reported that most special education teacher preparation programs "offer minimal to no AAC content" and "do not require compulsory AAC training" (p. 208).

Unfortunately, the current study mirrors previous findings, suggesting that teacher preparation programs are still not providing the AAC training special education teachers need to adequately serve students with complex communication needs. Furthermore, special education teachers in Texas have limited knowledge and skills in AAC and only their years of experience serving students with complex communication was a significant factor in their knowledge and skills. These results mirror national findings, yet the question that remains unanswered is *what can be done in Texas to ensure that special education teachers are highly equipped to serve all their students*?

The approach that Texas currently follows to training future special education teachers (i.e., requiring a cross-categorical special education teacher certification), may, in theory, prepare future teachers to gain the knowledge and skills needed to serve all students with disabilities. Yet, the lack of specialization in a specific concentration area or disability categories may make the process of training future educators challenging for teacher preparation programs, special education teachers who serve these students, and school districts. For example, in a nationwide view of special education teachers' knowledge and skills in AAC, Da Fonte et al. (in press) suggested that special education teachers who held a categorical teacher certification had higher levels of knowledge and skills than teachers who reported holding a cross-categorical teacher certification. More specifically, Da Fonte et al. (in press) indicated that special education teachers who completed a teacher certification preparation program in low incidence disabilities, such as in the areas of autism, intellectual disabilities, and multiple disabilities, self-reported higher levels of knowledge and skills than other concentration areas.

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Collaboration between special education teachers and other related service providers, such as speech language pathologists and families, may also be an important element to take into account given that addressing the needs of students with complex communication needs requires a team approach. For example, Participant 337 indicated that "*it takes a team, just like the teacher is often the most knowledgeable about where a student struggles in math and what is needed to help them with math, in today's time teachers must also be nearly as knowledgeable about a students' communication skills and strategies.*" Only through collaborative teaming can effective AAC services be provided to students with complex communication needs to help close the current training gaps.

Limitations and Future Research

Although efforts were made to obtain a large, diverse sample size, results should be viewed with caution, as there were a small number of participants included in this study. Because data for this paper were taken from a larger dataset from a nationwide study, the end sample size was small and not fully representative of the number of special education teachers across Texas. Even though this was the case, it is important to highlight that national results mirror the findings for Texas special education teachers. A limitation that is worth noting is that only school administrators' information was collected to recruit participants. This method was employed because the administrators' emails were the only accessible, publicly available contact information that did not involve searching each school's website for teacher information for individual emails. At this same time, the implementation of snowball sampling may have also had an impact on the sample size. To address these limitations, future replications of the study should aim to recruit special education teachers in Texas directly, to gather a larger sample size, and, therefore, increase the response rate and obtain a more diverse sample group.

Conclusion

The purpose of this study was to provide a brief outlook into Texas special education teachers' self-reported knowledge and skills in AAC. Because communication skills are an essential milestone for literacy development, self-determination skills, and independence, it is essential that special education teachers have the knowledge and skills needed to effectively support these students. Unfortunately, based on the results, the majority of special education teachers *lack* knowledge and skills in AAC. These findings are concerning as such a lack of knowledge and skills may likely impact the service provided to students with complex communication. To support special education teachers and their students more effectively, it is important for state officials, teacher preparation programs, and school districts to consider how to enhance special education teachers' knowledge and skills to support *all* their students.

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